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EXPORT–LED GROWTH HYPOTHESIS: ECONOMETRIC EVIDENCE FROM MALAYSIA

Abstract

The objective of this paper is to test the validity of the Export-led Growth Hypothesis (ELGH) in the Malaysian economy. Malaysia has always been considered to have attained its growth primarily through exports (Okposin, Bassey, Hamid, Halim, and Boon, 1999; Mun, 2008; Mahathir, 1990). In the past, several studies on this topic have been conducted but their analyses were limited to relationships using Bound-testing, Autoregressive –Distributed Lag (ARDL) and the Toda Yamamoto analysis. Empirical data and analysis in our paper cover a 21 – year span and quarterly time-series data (1991:Q1 – 2012:Q4) are used to test this ELG hypothesis. Also, many dynamic econometric measures including the Augmented Dickey Fuller (ADF) and Phillip – Perron (PP) unit root tests, Cointegration test as well as the Vector Error Correction model (VEC) for the long run have been applied. Based on these generic models, both real exports and capital stock (productivity) are found to have stimulated positive adjustments to economic growth in the long run whereas real exchange rate is found to have influenced economic growth negatively. Overall, our conclusion is that the ELG hypothesis seems applicable to Malaysia in the long run.

Key Words: export-led growth hypothesis, unit root test, cointegration test, vector error correction model (VECM).

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INTRODUCTION

It is a general macroeconomic understanding that higher exports will lead to higher GDP. Basic macroeconomics textbooks all teach us this principle (Lipsey and Chrystal, 2011; McConnell, Brue, and Flynn, 2009). This relationship comes from the simple understanding of GDP which is an aggregation of a country's consumption, investment, government expenditure and net exports. Net exports are the difference in total exports and imports of an economy. Higher exports mean higher positive net exports and thus an increment to GDP. This understanding, no doubt, is clear. But, at times, we may or may not be able to see this positive relationship empirically. For instance, this positive relationship was not seen in Mexico where because of an increase in the exports, final goods imports became higher with each increment in exports thereby resulting in negative trade balance (Ibarra, 2008).

To date, many theoretical and empirical analyses on the export-led growth (ELG) hypothesis have been carried out using different approaches and measurement methods. Historically, Malaysia like other Asian tigers has been export-oriented moving from manufacturing to services with the advancement of Multimedia Super Corridor (MSC) concept (Mun 2008). Malaysia is always considered to have attained its growth primarily through exports (Okposin et al., 1999; Mun, 2008; Mahathir, 1990) so in this paper, we will investigate to what extent it has occurred or if it has occurred at all. The different empirical techniques and their related problems, our choice of techniques and the reasons behind them and the empirical treatment of the ELG hypothesis based on Malaysian data are also provided in our paper.

An important factor concerning exports and GDP growth is the real exchange rate. The theoretical argument is that when real exchange rate of a country hikes up, its exports becomes relatively expensive and imports cheaper leading thereby to a trade deficit and thus a decrement in GDP (Handa, 2000; Salvatore, 2007). This rationale again is jeopardized by various other factors involved. Different contradicting studies are identified and discussed in the review section. Our research, therefore, aims to determine whether this relationship exists in Malaysia besides identifying the major factors involving GDP growth and exports.

Productivity is another factor often identified as the catalyst of economic growth. Labor productivity is generally defined as the quantity of output per unit of worker or sometimes per unit of time spent by them. Higher productivity means higher production contribution per head thus resulting in higher amount of output in total. This simple relationship is the least doubted compared to that of the other two factors that will be discussed next. As

Freeman (2008) says "It [labour productivity] is the measure of labour productivity which helps explain the principal economic foundations that are necessary for both economic growth and social development." It is to be noted that productivity in Malaysia is considered above average.

Therefore, in this paper we are going to examine the applicability of the ELG hypothesis in Malaysia using quarterly time series data covering a 21 year period of 1991 – 2012. Our study also differs from other earlier studies on export – performance in Malaysia not only terms of time – span but also in terms of methodology. For more reliable and vigorous empirical testing of the ELG hypothesis, we utilize established econometric tests which include the ADF, PP, Cointegration tests and Vector Error Correction Model.

LITERATURE REVIEW

Despite the extensive literature covering the relationship between exports and GDP, there is no clear consensus on whether exports actually cause economic growth. The literature from different countries involving different time intervals and statistical methods are mostly also quite different in their conclusions. Koccat (2008), by evaluating time series quarterly data, had concluded that no long-run equilibrium relationship had been found between real income per capita, real exchange rates and real exports in Turkey - a developing nation. Ribeiro (2001) investigated the Granger-causality between exports, imports and economic growth in Portugal for the period 1965-1998. The role of the third variable (imports) in the investigation of export-output causality is emphasized, enabling one to test for the cases their direct causality, indirect causality, and spurious causality between export growth and output growth.

The empirical results all do not confirm a unidirectional causality between the variables considered. In the Tang and Lai (2011) case study, it was shown that there was bilateral causality between exports and GDP for Hong Kong and Singapore, while there was only unilateral causality running from GDP to exports for Korea and Taiwan. Also in Cuba, for the long period from 1960 to 2004, Fugarola, Mañalich, and Matesanz (2007) results showed that the export led growth (ELG) hypothesis is not an appealing hypothesis.

By means of input-output analysis, in three different periods 1978-1982, 1983-1987 and 1988-1994, Napoles (2001) produced a similar result for Mexico. He emphasized that the export-led growth (with liberalisation) strategy implemented in Mexico, may have succeeded in promoting manufacturing exports but it has clearly failed in fostering

growth and reducing the trade imbalance. His results show that the effect of increasing manufacturing exports on expanding production is offset by the increasing manufacturing imports displacing domestic production.

Subasat (2002) did investigate the Granger causality relationship between non-oil export and economic growth based on panel cointegration analysis for 73 developing countries. For oil countries, the short-run causality relationship between the variables was not found. But for the rest, causality relationship was shown to exist both in the long-run and the short-run. Nevertheless, Vu (2011) suggests that for the industrializing nations particularly those with significant fluctuations in trade regimes over time, long run averages may not serve as very meaningful indicators of open trade policy.

For Malaysia, Ghatak, Milner and Utkulu (1997) was one of the earliest to check on the occurrence of export-led hypothesis in Malaysia over a long period of time from 1955 to 1990. Using Cointegration and Causality Testing based on Hsiao's synthesis of the Granger test and Akaike's Minimum Final Prediction Error Criterion, they had concluded that aggregate exports Granger-cause real GDP. It also indicated that real export growth also Granger-causes non-export real GDP growth for Malaysia over the long run as there was robust support for cointegration between exports and GDP. Khalafalla and Webb (2001) however, detected one important flaw in Ghatak et al.'s (1997) examination, which is that they did not explain how to deal with the political separation of Singapore from Malaysia in 1965. It was pointed out that the significant role of manufactures in economic growth may be due to the inclusion of Singapore's trade in the first ten years of their time series.

Choong, Yusop and Liew (2005) provides further evidence to support the export-led growth hypothesis in Malaysia between 1960 to 2001 where it showed that exports Granger-cause economic growth. Ibrahim (2001), for the time period 1960-1997 finds evidence for bi-directional causality between exports and real output per capita but the issue of exogeneity weakens the case for the export-led growth hypothesis. Ekanayake's (1999) cointegration and error-correction models results show that bi-directional causality exists between export growth and economic growth in India, Indonesia, Korea, Pakistan, Philippines, Sri Lanka and Thailand and there is also evidence for export-led growth in Malaysia during the time period of 1960 to 1997.

Sulaiman and Saad (2009) did a 5-variables test employing Cointegration Test and Error Correction Model from the year of 1960 to 2005 in Malaysia to conclude with the positive long-run and short run relationships between export and economic growth and that of negative relationship with imports. Also, Baharumshah and Rashid (1999) conclude that

Malaysian economic growth is driven by exports. They applied the Johansen Procedure and Vector-Error Correction (VEC) model which suggested that export expansion strategy can contribute to a country's growth.

Similarly, Khalafalla and Webb (2001) did VAR analysis of quarterly trade and GDP growth in Malaysia for the period of 1965-1996 and confirmed the Export-led Growth Hypothesis for the full period and for the sub-periods of 1965-1980 which was a import-substitution period as regarded by national policy. For the next sub-period of export orientation (1981-1996), as Malaysia broadened its export base to include a growing proportion of manufactures, there is however a weakening of the export-led growth linkage. This relationship made Khalafalla and Webb argue that interaction among trade and growth variables becomes more complex with a broadening export base and more diverse sources of growth.

Mahadevan (2007) stated that economic growth is necessary for export growth and vice versa but they are not sufficient conditions for continued spillover effects. Using Toda and Yamamoto Causality Test for the period of 1974-2003 in Malaysia, he showed that export growth and trade-adjusted GDP growth were mutually causative. For, non-trade-adjusted GDP growth however, on the other hand, the internally generated growth hypothesis was supported since export was GDP growth-driven.

Tang (2013) is closer to Mahadevan (2007) as his employment of rolling regression based causality tests (from January 1975 to August 2010) demonstrate that the causality inferences for export-led growth hypothesis are unstable over time even when leveraged bootstrap simulation causality test suggests that exports and output growth are bilateral causality in nature.

Lim and Ho (2013) argues that the possibility of nonlinearity in the relationship has been generally ignored and thus examines the potential nonlinear long-run and short-run relationships by nonparametric cointegration test and nonlinear causality test in five of the ASEAN countries and found that in Malaysia, Thailand, Indonesia and Singapore, the nonlinear long-run relationship between exports and GDP per capita exists.

Mahadevan (2007), in addition to verifying the ELG hypothesis, added that exports' relationship with labour productivity growth is bidirectional and labour productivity growth is import growth-driven but not the reverse. However, when the GDP-led growth export link is examined, Total Factor Productivity (TFP) growth is not a potential channel but there is some evidence of labour productivity growth having had a role in it. Earlier on,

Mahadevan's (2002) study on Malaysia's manufacturing sector showed empirical evidence suggesting that its output growth depended on input growth that is positively biased towards skilled labour productivity. He adds that enhancing skilled labour would in turn require capital deepening (such as the use of better and more advanced technology) thereby suggesting the positive relationship between capital inflows and manufacturing output.

The debate about the relationship between exchange rate and economic growth is going on as much as that of the ELG hypothesis. However, the importance of the exchange rate stabilization in economic development is rarely denied. The literature on this aspect in Malaysia is limited however.

Kogid, Asid, Lily, Mulok, and Loganathan (2012) did ARDL bounds test for the time spanning from 1971 to 2009 in Malaysia which suggest that long-run cointegration exists between both nominal and real exchange rates and economic growth. For the real exchange rate, significant positive coefficients were exhibited with economic growth. Also, the results of ECM-based ARDL also reveal that both exchange rates have a similar causal effect towards economic growth. Yol (2013) employed two-stage-least squares method on annual data from Malaysia for the period of 1980-2005, with the results suggesting that a stable long-term economic growth requires stable exchange rate system among other things. His study finds that real exchange rate misalignment during the time in Malaysia beneficially affected economic growth.

Sulaiman and Saad (2009) agrees on positive relationship; he examines the effects of real exchange rate during the pegged exchange rate regime (1977:1-1998:2) and the extended model from 1977:1 to 2001:4 to include the period of fixed exchange rate regime. The cointegration results show that, in both cases, a real depreciation leads to an improvement in the Malaysian trade balance in the long run. Examining the annual data from 1970 to 2004 from Malaysia and Turkey, Masron and Ahmad (2009) study also suggested that exchange rate volatility has the ability to exert a negative influence on the demand for exports and output in Malaysia and Turkey.

However, due to regional economic integration, they conclude that the impact is no longer significant in the case of Turkey. Using ARDL approach, Wong (2013) also concluded that an increase in real exchange rate misalignment will lead to a decrease in economic growth. More specifically, he said that devaluation will promote economic growth and appreciation will hurt economic growth.

DATA AND METHODOLOGY

This study will apply the hypothesis of "Export-led Growth Hypothesis" to the Malaysian economy. The empirical data and analyses in this paper cover a 21-year-period using quarterly time - series data (1991:Q1-2012:Q4) which should be adequate to test the long – run relationship between the independent and dependent variables. The data series required involves Gross Domestic Product (GDP), exchange rate, export and capital stock.

For GDP, we use real gross domestic product. The real exchange rate is represented by employing real exchange rate based on the bilateral exchange rate with reference to the US dollar. For capital productivity it is based on capital stock proxied by gross fixed capital formation (CSP). The data are obtained from Bank Negara Statistics, IMF's International Financial Statistics database (IFS) and complemented by data from www.econstats.com for chosen years. GDP is used as it encompasses the largest amount of economy activity in Malaysia. To examine this hypothesis, the generic model applied takes the form as given below:

$$LnRGDP = \beta_0 + \beta_1 LnREX + \beta_2 LnREER + \beta_3 LnCSP + \varepsilon_t$$

where:

LnRGDP = Natural Log of Real Gross Domestic Product
LnREX = Natural Log of Real Exports
LnREER = Natural Log of Real Exchange Rate
LnCSP = Natural log of Capital Stock. (Proxy by capital productivity)

UNIT ROOT TEST

In order to avoid spurious results, we have conducted the test for the stationarity. Time series is considered as stationary if a series is mean – reverting, that is, the series repeatedly returns back to its mean and does not have a tendency to drift (Asmy, Rohilina, Hassama, and Fouad, 2010). Therefore, if the mean and variance of the series are constant over time, while the value of the covariance between two periods depends only on the gap between the periods and not on the actual time at which the covariance is considered, then the series is stationary. But if one of the above conditions is not fulfilled, then the series is non – stationary (Paramaiah and Akway, 2008).

This study uses the most commonly used tests, namely; the Augmented Dickey – Fuller (ADF) and the Phillips – Perron (PP) tests. ADF is applied when the error term (U_t) is

correlated. If it is not, we can only use the Dickey – Fuller test. ADF is performed by adding the lagged values of the dependent variable ΔY_t. The null hypothesis for ADF test for unit root test is $\propto_1 = 0$. We can apply the example of (Gujarati, 2009) for running the ADF. The following regression is for the ADF test purpose:

$$\Delta Y_t = \beta_1 + \beta_{2t} + \delta Y_{t-1} + \alpha_i \sum_{i=1}^{m} Y_{t-1} + \varepsilon_t$$

where β_1 and β_2 are parameters, t is the time or trend variable, δ indicates drift, ε_t is a pure white noise error term and $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2}), \Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$ etc. However, ADF also has its own critics. (Paramaia and Akway, 2008) claimed that the ADF test has good size but poor power properties.

On the other hand, the Philip – Perron test (PP) is used to control the higher – order serial correlation. PP test use non – parametric statistical methods and avoid the use of adding lagged difference terms as in the ADF test. The null hypothesis for PP test is $\beta_1 = 0$. The equation for PP test (Jeong, Fanara, and Mahone, 2002) is as follows:

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + e_t$$

COINTEGRATION TESTS

This analysis is to determine whether the time series of these variables display a stationary process in a linear combination. Generally speaking, cointegration means that data from a linear combination of two variables can be stationary despite them being individually non – stationary (Gujarati, 2009). Therefore, we have employed the Johansen method of Multivariate Cointegration. The result from cointegration explains the existence of a long – term relationship between the dependent and the independent variables. If there is at least one cointegrating relationship among the variables, then the causal relationship among these variables can be determined by estimating the VECM (Asmy et al., 2010).

The Johansen and Juselius method uses two tests to determine the number of cointegrating vectors (Adebiyi, 2007), namely the "Likelihood Trace Statistic" test (LTS) and the "Maximum Eigenvalue" test (ME). The equation for LTS is as follows:

$$LTS = -T \sum_{i-i+1}^{n} ln(1 - \mu i)$$

For this null hypothesis, it is said that the number of cointegrating vectors is less than or equal to r, in which r is 0, 1, 2, 3, 4, 5, 6 and so on. The alternate hypothesis against this is that r = n. The equation for Maximum Eigenvalue test is as follows:

$$ME = -T\ In\ (1 - \mu_t)$$

For this null hypothesis is that the existence of r cointegrating vector. And the alternate hypothesis is r +1 cointegrating vectors.

EMPIRICAL FINDINGS

Correlation matrix and descriptive statistics

Table 1 and Table 2 explain descriptive statistics and correlation matrix; there is positive correlation among real GDP, real exports and real domestic capital stock based on gross fixed capital formation. In addition to that, exports and real gross fixed capital formation are correlated positively. Real effective exchange rate and real GDP are inversely or negatively related. All series for said variables are transformed into log form. Series transformation into log directly gives elasticities and solves the problem of heteroscedasticity (Shahbaz, 2011).

Table 1: Correlation matrix

Details	LNRGDP	LNREX	LNREER	LNCSP
LNRGDP	1.000000			
LNREX	0.925558	1.000000		
LNREER	-0.638954	-0.802928	1.000000	
LNCSP	0.907166	0.823799	-0.392573	1.000000

Table 2: Descriptive statistics

Details	LNRGDP	LNREX	LNREER	LNCSP
Mean	24.94752	25.13136	4.725299	23.98890
Median	24.71658	25.23780	4.686017	23.94324
Maximum	26.00045	25.95045	4.944281	24.87545
Minimum	24.01769	23.79675	4.580682	23.14443
Std. Dev.	0.577475	0.636483	0.105062	0.412897
Skewness	0.236375	-0.576092	0.697157	0.081873
Kurtosis	1.589939	2.132509	1.946017	2.386563
Jarque-Bera	8.109805	7.626916	11.20163	1.478097
Probability	0.017337	0.022072	0.003695	0.477568

Unit root and stationary test

Table 3 reports the results of the ADF and PP unit root tests, with the individual lag chosen based on Akaike Information Criterion (AIC). Both of these tests are conducted with trend and intercept. The investigation using the Augmented Dickey Fuller (ADF) and PP summarized in Table 3 shows that there are no variables having unit root at level. However, unit root is obtained when the first difference condition of all variables are conducted using the same ADF and PP test by comparing the level using 1%, 5% and 10% alpha values.

Table 3: Unit root test

Variable	Level		First Difference	
	ADF	PP	ADF	PP
LnRGDP	0.4086	0.4047	0.0000***	0.0000***
	(-2.338938)	(-2.346461)	(-9.641456)	(-9.684859)
LnREX	0.9695	0.9392	0.0000***	0.0000***
	(-0.699861)	(-0.992592)	(-10.31971)	-18.75412
LnRRER	0.4022	0.5872	0.0000***	0.0000***
	(-2.351136)	(-2.010645)	(-6.773766)	(-6.656584)
LnCSP	0.3870	0.4088	0.0000***	0.0000***
	(-2.380600)	(-2.338729)	(-11.33757)	(-11.22069)

Values based on MacKinnon (1996) one sided p-values. The value in parenthesis refer to t-statistic. *, **, *** indicates significance at 10%, 5% and 1%.

Cointegration test

A set of variables will be cointegrated if a linear combination among the variables is stationary even though the variables are not stationary individually. If there exists cointegration, then there will be long run equilibrium among the variables. In this study, by employing the Johansen and Juselius Cointegration Test, we compare the value of the Likelihood Trace Statistic (LTS) with the 5% critical value and it was found that there exists only one cointegration in the long run (see Table 4).

Table 4: Johansen–Juselius cointergration tests

Hypothesized No. of CE(s)	Likelihood trace statistic (LTS)	Max-Eigen statistic (ME)	Critical Values (5%)	
			Trace (LTS)	Max-Eigen
r = 0	51.86395**	36.18837**	47.85613	27.58434
r ≤ 1	15.67558	10.73124	29.79707	21.13162
r ≤ 2	4.944334	4.691633	15.49471	14.26460
r ≤ 3	0.252701	0.252701	3.841466	3.841466

Note: **denotes significant at 5% significance levels
Lag Interval: 1 to 1 (Based on Optimal Lag Test)

Vector error correction model (VECM)

VECM estimation provides information regarding the velocity of adjustment on the instability relationship from short - term to long term equilibrium. Variables that are not stationary at level will be analysed by testing the unit root at the first difference level. This application of first difference data can eliminate the long term information in the study. For this reason, VECM will be used in order to anticipate a loss of long term information as long as the data are cointegrated. Normalizing GDP, Table 5 below shows the vector error correction term which depicts the long term relationship among the variables with the number in parentheses being the t-ratios (see Table 5).

Table 5: Vector error correction model

Explanatory variables	Dependent Variable	
	Coefficient	t-statistic
LnREX	-1.635518	-4.68450
LnREER	8.339595	6.51325
LnCSP	-2.505795	-7.12297
C	-45.35392	-
	R^2 = 0.923988	
	F-Statistics = 3.404 (0.0000)	
	Jarque Bera = 4.036870 (0.13286	
Diagnostic Test	LM = 0.121092 (0.8770)	
	RESET = 8.282032 (0.0051)	
	ARCH = 0.001025 (0.9742)	

Notes: (t_table for alpha 5% = 1.67 where the number of observation is 88. LM refers to the Lagrange Multiplier statistic for serial correlation, RESET refers to Ramsey's RESET test of misspecification of the functional form and ARCH represents the test for Autoregressive Conditional Heteroscedasticity.

Thus, the final long run VECM equation derived is as follows:

$$LnRGDP = 45.35392 - 1.635518LnREX + 8.339595LnREER - 2.505795LnCSP + \varepsilon_t$$

The equation above indicates the respective signs of all variables in the long run. The negative sign for the real export shows that any increase in real exports will cause an increase in GDP growth. This is because, as the real exports increase, it will stimulate the aggregate demand for the country and generate more revenue for the country. Demand for the local currency will thereby increase and make the country's currency stronger against the foreign currencies. The study by Al-Yousif (1999) has evaluated the robustness of the relationship between exports and economic growth in the context of Malaysia. He found that there was no long-run relationship between real GDP and real exports if the bivariate cointegration was used.

However in our paper, we discovered a long run relationship between real GDP and real exports using the Vector Error Correction Model. On the other hand, when Al-Yousif (1999) applied multivariate methodology in testing the long – run relationship between real GDP and some selected determinants, he found that there was strong evidence to justify that there exists a cointegrating vector among these variables. This is consistent with our study as well. These confirm findings from previous studies whereby Subasat (2002) showed that exports for countries that are in the intermediate stage of development have a positive effect on economic growth. But for countries which are at the low or high levels of development, a significant relationship between increased exports and economic growth is not observed.

For countries at a medium level of development, Sarkar (2000) found a significant positive relationship between exports and economic growth. Similarly DrittSakis (2004) analyzed the relationship between economic growth, investment and exports in the case of Romania and Bulgaria and his results showed a cointegration relationship existed between three variables. Also, both exports and investment had a positive effect on real GDP.

The estimation result shows that real exchange rate is negatively related to the economic growth whereby fluctuations in the exchange rate may slow down the growth of economic growth. This is consistent with Choong et al. (2005), whereby the Malaysian government has succeeded by improving the competitiveness of Malaysia export goods in the international markets and stimulating the economy by devaluating its currency in the early 1990s. But this same policy was not applicable during the 1997 Asian Financial Crisis as most of the currencies in the East Asian countries have already been much depreciated.

As a result, depreciation of the currency will make the country's economy deteriorate further as more domestic currency becomes available in the foreign exchange (FOREX) market this will further reduce the value of domestic currency in forex. This was one of the

reasons why the Malaysian government fixed the exchange rate against US Dollars in order to overcome the problem during 1997 Asian Financial Crisis (Choong et al., 2005). The findings are consistent with Shahbaz (2011) as well whereby devaluation – based adjustment policies may not achieve desired effects of improvement in the trade balance due to losing out on the competitiveness in international markets.

The negative sign in Capital Stock indicates that when the capital stock increases, the economy will grow faster. In the developed economies, the situation is different: technological progress and innovation (reflected in high growth in total factor productivity) spearhead growth. These factors are far more important than growth in the traditional growth factors such as labour force and capital investment in determining economic growth. A high rate of capital formation, particularly over and above the investment needed to replace obsolete or used capital represents a net increase in fixed investment which creates productive capacity for economic growth. Such investment will boost the country's productive capacity and thus growth and standard of living without giving rise to inflationary pressure (Freeman, 2008).

Foreign investment has returned to Malaysia which augurs well with the short- and long-term growth of the Malaysian economy. The prospects for capital formation to accelerate are encouraging, given the recent large increase in planned manufacturing investment of about RM41,052.4 million in the quarters of 2011 and 2012, Malaysia's high international competitiveness, investment initiatives in the 9MP, high capital expenditure by large companies, and high capacity utilization rate in the manufacturing sector.

In addition, Malaysia remains committed to continuously improve the business environment and thus reduce the cost of doing business to attract both domestic and foreign investment (World Economic Review, 2011). Coupled with strong Japan, Euro area and Asia, the present acceleration in the US economy will be positive to capital spending in Malaysia. This is consistent with the study done by Najarzadeh and Maleki (2005) which showed the relationship between foreign direct investment and economic growth of Indonesia, Malaysia, Venezuela, Saudi Arabia and Iran is positive. This impact is mainly through the use of improved human capital.

To test the robustness of the error correction model, researchers apply a number of diagnostic tests. No evidence was found for normality failure, serial correlation, and misspecification of the functional form, Heteroscedasticity and Autoregressive Conditional

Heteroscedasticity (ARCH) effect in the disturbances. Therefore, the model is applicable for our study.

Error correction model (ECM)

The presence of cointegration indicates that at least one of the variables tests react to deviations from the long - run relationship. Therefore, we investigate whether GDP growth corrects for disequilibrium. Our dynamic causal link between dependent and independent variables can be formulated as follows:

$$\Delta LnRGDP = \eta_0 + \eta_{1i}\sum_{i=0}^{1}\Delta LnREX_{t-i} + \eta_{2i}\sum_{i=0}^{1}\Delta LnREER_{t-i} + \eta_{3i}\sum_{i=0}^{1}\Delta LnCSP_{t-i} + \eta_{4i}EC_{t-1} + E_t$$

where EC_{t-1} is the GDP growth error correction term (lagged residual of statistics regression) and "Δ" stands for first difference. Based on Table 6, the estimated coefficient for ECT is 3.26% which is significant at 1% significance level, suggesting that the last period (quarter) disequilibrium in GDP growth is corrected in the next quarter by 3.26%. This value implies that any shock that forces GDP growth from their long run value will take a long time for GDP to return to its equilibrium unless there are other shocks that counter the initial one.

Table 6. Error correction model of "export-led to growth hypothesis"

Error Correction	Parameter Estimate	Standard Error	t-statistics
ECT	-0.036283	0.03119	-1.16316***

*, *** indicates significance at 10%, 5% and 1%.

CONCLUSIONS

This study tried to analyse the long - run relationship between economic growth and exports using the Export-led Growth Hypothesis. We studied the long term relationships between Real GDP, Real Export, Real Exchange Rate and Capital Stock (Productivity). All variables studied were non - stationary, but the differences were stationary. To study the long term relationship between these variables, the Johansen and Juselius Cointegration test were used.

Results indicate that at least one of the variables has cointegration or association in the long run at 95% confidence interval. It can clearly be noted from the error correction term (ECT) that the relationship of economic growth and export and capital stock is positive. On the other hand, the relationship between economic growth and real exchange rate is negative. This is consistent with Doraisami (1996) and Al-Yousif (1999). We can therefore draw a conclusion that the Export-led Growth Hypothesis seems applicable to Malaysia based on the results of our study.

Malaysia's experience with its exports drive has been both a rewarding and happy one. Exports have transformed the country into one of the power – houses of Southeast Asia and have once earned it the title of one of the "Asian economic tigers" because of the impressive economic growth since the Seventies. This success was a direct result of the government's relentless pursuit of its goal of achieving growth through enhanced export competitive.

The Ministry of International Trade and Industry (MITI) particularly, has played a significant role in Malaysia involvement in regional economic groupings and trade negotiations so that trade is facilitated, trade barriers are reduced or eliminated and market accessibility for Malaysia exporters is enhanced. In this era of globalization, such efforts which ranged from the removal of tariffs and non – tariff barriers creation of export processing zones, provision of export credits and the like must be further intensified and improved upon so that Malaysia can build upon its formidable reputation as a leading exporter nation amongst the Asian countries.

REFERENCES

Al–Yousif, Y. K. 1999. On the role of exports in the economic growth of Malaysia: A multivariate analysis. *International Economic Journal* 13(3): 67-75.

Asmy, M., W. Rohilina, A. Hassama, and M. Fouad. (2010). Effect of Macroeconomic variables on stock price in Malaysia: An approach of error correction model. *The Global Journal of Finance and Economics* 7(2): 149-164.

Baharumshah, A. and S. Rashid. 1999. Exports, imports and economic growth in Malaysia: empirical evidence based on multivariate time series. *Asian Economic Journal* 13(4): 389-406.

Choong, C. K., Z. Yusop, and V. K. S. Liew. 2005. Export- led growth hypothesis in Malaysia. An investigation using bound test. *Sunway Academic Journal* 2: 13-22.

Drittsakis, N. 2004. Export, invetsment and economic development of pre–accession countries of the European union. An empirical investigation of Bulgaria and Romania. *Applied Economics. Applied Economics* 36(16): 1831-1838.

Doraisami, A. 1996. Export growth and economic growth. A re-examination of some time series evidence of Malaysia. *Journal of Developing Areas* 30: 230-233.

Ekanayake, E. 1999. Exports and economic growth in Asian developing countries: Cointegration and error-correction models. *Journal of Economic Development* 24(2): 43-56.

Fugarola, G., I. Mañalich, and D. Matesanz. 2007. Are exports causing growth? Evidence on international trade expansion in Cuba, 1960-2004. Germany: University Library of Munich.

Freeman, R. 2008. Labour productivity indicators comparison of two oecd databases productivity differentials & the balassa-samuelson effect. *OECD Statistics Directorate*.

Ghatak, S., C. Milner, and U. Utkulu. 1997. Exports, export composition and growth: cointegration and causality evidence for Malaysia. *Applied Economics* 29(2): 213--223.

Gujarati, D. N. 2009. *Basic Econometrics*. New York: McGraw Hill.

Handa, J. 2000. *Monetary economics*. London: Routledge.

Ibarra, C. 2008. Exporting without growing: Investment, real currency appreciation, and export-led growth in Mexico. *The Journal of International Trade & Economic Development* 19(3): 439-464.

Ibrahim, M. 2001. An empirical note on the export-led growth hypothesis: The case of Malaysia. *Economic Analysis and Policy* 32(2): 221-232.

Jeong, J. G., P. (Jr.) Fanara, and C. E. (Jr.) Mahone. 2002. Intra and inter-continental transmission of inflation in Africa. *Applied Economics* 12: 731-741.

Khalafalla, K. and A. Webb. 2001. Export-led growth and structural change: Evidence from Malaysia. *Applied Economics* 33(13): 1703-1715.

Koccat, H. 2008. Exchange rates, exports and economic growth in Turkey: Evidence from Johansen cointegration tests. *International Journal of Economic Perspectives* 2(1): 5-11.

Kogid, M.., R. Asid, J. Lily, D. Mulok, and N. Loganathan. 2012. The effect of exchange rates on economic growth: Empirical testing on nominal versus real. *The IUP Journal of Financial Economics* 10(1): 7-17.

Lim, S. and C. Ho. 2013. Nonlinearity in ASEAN-5 export-led growth model: Empirical evidence from nonparametric approach. *Economic Modelling*, 32: 136--145.

Lipsey, R. and K. Chrystal. 2011. *Economics*. Oxford: Oxford University Press.

Mahadevan, R. 2002. Assessing the output and productivity growth of Malaysia's manufacturing sector.*Journal of Asian Economics* 12(4): 587-597.

Mahadevan, R. 2007. New Evidence on the export-led growth nexus: A case study of Malaysia. *The World Economy* 30(7): 1069-1083.

Mahathir, M. 1990. Vision 2020, Prime Minister's Office of Malaysia. [online] Available at: http://www.pmo.gov.my/?menu=page&page=1904. [Accessed: 19th July 2013].

McConnell, C., S. Brue, and S. Flynn. 2009. *Macroeconomics*. Boston, M.A.: McGraw-Hill.

Mun, H. 2008. *Malaysian economic development: issues and debates*. [e-book] Kuala Lumpur: www.harwaimun.com. p.3-16. Available through: http://harwaimun.com/ http://harwaimun.com/Malaysian_Economics_Development.pdf [Accessed: 30th April 2013].

Najarzadeh, R and M. Maleki. 2005. The effect of FDI on economic growth with emphasis on exporting countries. *Journal of Economic Research* of IRAN, 5(2): 401-405.

Napoles, R. 2001. Liberalisation, exports and growth in Mexico 1978-94: A structural analysis. *International Review of Applied Economics* 15(2):163-180.

Okposin, S., S. Bassey, A. Hamid, A. Halim, and O. H. Boon. 1999. *The changing phases of Malaysian economy*. Subang Jaya, Selangor Darul Ehsan, Malaysia: Pelanduk.

Paramaiah, C. and O. M. Akway. 2008, *Econometric analysis of personal consumption expenditure in Ethiopia.* Andhra Pradesh. India: The ICFAI University Press.

Ribeiro, F. 2001. Exports, imports, and economic growth in Portugal: Evidence from causality and cointegration analysis. *Economic Modeling* 18(4): 613-623

Sarkar, A. 2000. A model of Brokers' trading with applications to order flow internalization. *Review of Financial Economics* 11(1): 19-36.

Salvatore, D. 2007. *International economics*. New York: Wiley.

Shahbaz, M., 2011. Export-led growth hypothesis in Pakistan: Further evidence. *Asian Economic and Financial Review* 1(3):182-197.

Subasat, T. 2002. Does export promotion increase economic growth? Some cross-section evidence. *Development Policy Review* 20(3): 333-349.

Sulaiman, M. and N. Saad. 2009. An analysis of export performance and economic growth of Malaysia using co-integraton and error correction models. *The Journal of Developing Areas* 43(1): 217-231.

Tang, C. 2013. A revisitation of the export-led growth hypothesis in Malaysia using the leveraged bootstrap simulation and rolling causality techniques. *Journal of Applied Statistics* 40(11): 1-9.

Tang, C. and Y. Lai. 2011. The stability of export-led growth hypothesis: Evidence from Asia's four little dragons. *Munich Personal RePEc Archive, University of Malaya*, (27962).

Wong, H. 2013. Real exchange rate misalignment and economic growth in Malaysia. *Journal of Economic Studies* 40(3): 298-313.

World economic review. 2011. *The report on Malaysia 2011*. London, U.K.: Oxford Business Group.

Yol, M. 2013. Exchange rates and economic growth in emerging economies: The case of Malaysia. *Research Bulletin of the Faculty of Economics and Management* 204(20): 77-86.

Vu, K. 2011. Sources of Singapore's economic growth, 1965-2008 trends, patterns and policy implications. *ASEAN Economic Bulletin* 28(3): 315-336.